

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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IN THE APPLICATION OF:

ROGER MOONS

CASE NO.: AD6883USNA

APPLICATION NO.: 10/627902

GROUP ART UNIT: 1761

FILED: JULY 25, 2003

EXAMINER: DREW E. BECKER
CONFIRMATION NO.: 3469

FOR: IMPROVED THERMOPLASTIC POLYMERIC OVENWARE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION UNDER 37 C.F.R. 1.132

1. I obtained a B.S. in Chemistry from the Polytechnic Institute of Brooklyn in 1962 and a Ph.D. in Organic Chemistry from the University of California at Davis in 1967.
2. I am currently receiving a pension from the assignee of this application E.I. DuPont de Nemours & Co., Inc. (hereinafter DuPont).
3. I am a Registered Patent Agent (No. 33,852).
4. I am currently a consultant for DuPont on technical and patent matters.
5. While consulting for DuPont I directed an experiment as set forth below.
6. A composition containing 55 weight percent of Zenite® 6000 Liquid Crystalline Polymer (available from E. I. DuPont de Nemours & Co., Inc., Wilmington, DE 19998 USA), 37 weight percent talc, and 8 weight percent carbon fiber was prepared by melt mixing in a 30 mm Werner & Pfleiderer twin screw extruder. The techniques used to prepare this composition were similar to those commonly used to prepare other compositions containing LCPs.
7. The above composition was molded in a 6 oz. HPM injection molding machine into 4 inch diameter disks.

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NO. 1294 P. 8

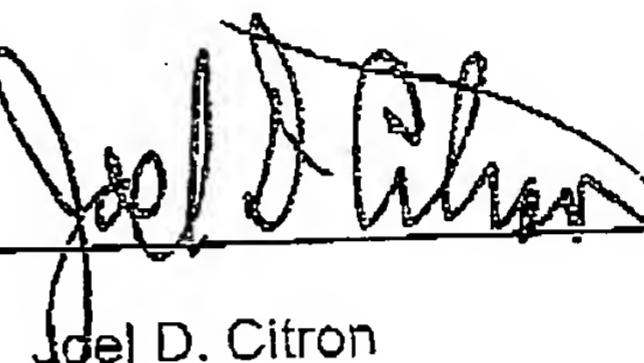
Application No.: 10/627902
Docket No.: AD6883USNA

JUL 11 2008

Page 2

8. An above described disk (after machining) was tested for through plane thermal conductivity. The resulting value was 0.368 W/m°K.

9. The attached pages from Electronic Research Notebooks D100052 and D100008 describe this experiment and the conditions used for the various operations. The sample number for the above described composition was 13-1. The composition of sample 13-2 has been blanked out from the page, and the results for the thermal conductivity of this sample have been omitted.



Joel D. Citron

Date: Mon 2, 2007

T:\Patent Documents\Eng. Polymers\AD-68xx\AD6883\AD6883 Declaration of Joel Citron.doc



DuPont Electronic Laboratory Notebook

Identification Number : D100052-28.01

Experiment Name : D100052-13

Program Name : Zenite

Project Name: Thermoconductivity for Joel Citron

Document Name : D100052-13 series Thermal Conductive Zenite Joel Citron.pdf

Site Name : E2P ST

Business Unit : Engineering Polymers

Author Name : Mike J. Molitor

Date : 02/26/2007 14:59:57

Co-Author Details :

Witness Name : Adcock, Dave

Date : 02/26/2007 15:03:04

Date (GMT)	Signed by
2/26/2007 07:59:57 PM	Name: Mike J. Molitor Pre-Sig Hash: 9b9c723fedbb8ec913753be9ae4abc415c4f0fa1
Justification	By entering your password you verify that you planned and/or executed the work, directed the work, analyzed the result, or drew the conclusions described within this document.

2/26/2007 08:03:05 PM	Name: Adcock, Dave Pre-Sig Hash: e004778267da1f14eed9d10dd217ba3081745b91
Justification	By entering your password you will be signing to say that you have witnessed the information contained in this document

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	Pre-Sig Hash:
Justification	

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	Pre-Sig Hash:
Justification	

	Name:
	Pre-Sig Hash:
Justification	

	Name:
	Pre-Sig Hash:
Justification	

Information in this report is proprietary and should be handled according to DuPont Information Security policies

E.I. du Pont de Nemours and Company

Sample # D100052	13-1	13-2
Zenite 6000	55	
Jetfil Talc 575C	37	
Carbon fiber Sigratil	8	

E. I. du Pont de Nemours and Company

11156S-36

ITEM	13-1	13-2
RESEARCHER	ML	TECHNICAL STAFF
SAMPLE	13-1	13-2
DIE	13-1	13-2
POLYMER	13-1	13-2
INTERLOCK CHECKED	13-1	13-2
MATERIALS EQUIPMENT USED	13-1	13-2
ADAPTER	13-1	13-2
SCREW	13-1	13-2
BARREL	13-1	13-2
BARREL 2	300	322
BARREL 3	301	309
BARREL 4	302	314
BARREL 5	303	307
BARREL 6	304	327
BARREL 7	305	348
BARREL 8	306	301
BARREL 9	307	304
BARREL 10	308	340
BARREL 11	309	321
BARREL 12	310	321
BARREL 13	311	321
BARREL 14	312	321
BARREL 15	313	321
BARREL 16	314	321
BARREL 17	315	321
BARREL 18	316	321
BARREL 19	317	321
BARREL 20	318	321
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BARREL 26	324	321
BARREL 27	325	321
BARREL 28	326	321
BARREL 29	327	321
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BARREL 32	330	321
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BARREL 38	336	321
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BARREL 54	352	321
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BARREL 57	355	321
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BARREL 103	401	321
BARREL 104	402	321
BARREL 105	403	321
BARREL 106	404	321
BARREL 107	405	321
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BARREL 169	467	321
BARREL 170	468	321
BARREL 171	469	321
BARREL 172	470	321
BARREL 173	471	321
BARREL 174	472	321
BARREL 175	473	321
BARREL 176	474	321
BARREL 177	475	321
BARREL 178	476	321
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BARREL 198	496	321
BARREL 199	497	321
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BARREL 220	518	321
BARREL 221	519	321
BARREL 222	520	321
BARREL 223	521	321
BARREL 224	522	321
BARREL 225	523	321
BARREL 226	524	321
BARREL 227	525	321
BARREL 228	526	321
BARREL		

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NO. 1294 P. 11


DuPont Electronic Laboratory Notebook

Identification Number : D100008 32.03

Experiment Name : D100008-1B

Program Name : Zenite

Project Name: Thermal Conductivity

Document Name : ThermalConductivityofD100052-1B-Land13-2.pdf

Site Name : EXP ST

Business Unit : Engineering Polymers

Author Name : Adcock, Dave

Date : 02/26/2007 12:57:03

Co-Author Details :

Witness Name : Harvey, Pat A.	Date : 02/26/2007 12:57:04
2/26/2007 05:57:03 PM	Name: Adcock, Dave Pre-Sig Hash: 73b0cadec1bdedf8234bdc64d812e2e301af81ba By entering your password you verify that you planned and/or executed the work, directed the work, analyzed the result, or drew the conclusions described within this document.
2/26/2007 06:07:04 PM	Name: Harvey, Pat A. Pre-Sig Hash: 73b0cadec1bdedf8234bdc64d812e2e301af81ba By entering your password you will be signing to say that you have witnessed the information contained in this document
	Name: Pre-Sig Hash:

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INSTRUMENTAL TEMPERATURES AND SAMPLE TEMPERATURES ARE IN CELSIUS UNLESS OTHERWISE STATED.

THE HEATER IS TURNED ON AT 20°C AND THE SAMPLE IS COOLED DOWN TO 10°C.

THE SAMPLE IS COOLED DOWN TO 10°C.

THE SAMPLE IS COOLED DOWN TO 10°C.

SAMPLE ID: 13-1

SAMPLE THICKNESS: 3.03mm

Average sample temperature = 18.4°C Controller= 20 °C

TG (C)	TG (C)	SL (C)	TH (C)	DT (C)	Q	RATIO
20.0	18.2	40.4	39.0	-1.64	5472.1	0.221266
20.0	18.0	40.6	39.1	-1.75	5006.7	0.195557
20.0	18.1	40.8	39.1	-1.73	10167.1	0.195166

Average sample temperature = 18.4°C Controller= 20 °C

TG (C)	TG (C)	SL (C)	TH (C)	DT (C)	Q	RATIO
78.1	65.9	52.8	49.3	-18.74	8854.4	0.233231
85.2	72.0	55.6	54.7	-19.65	10161.7	0.195207
85.2	72.0	55.6	54.7	-19.62	10157.8	0.195013

USING CALIBRATION FILE: ESL64200

USING FIRST ORDER FIT

USING TEST FILE: 13-1.txt

SAMPLE ID: 13-1
SAMPLE THICKNESS: 3.03mm
CTE: 0.00014000

THE SAMPLE HAS A THERMAL CONDUCTIVITY OF 3.551347e-001 W/mK AND A THERMAL RESISTANCE OF 2.295308e-003 m2K/W AT A TEMPERATURE OF 20.75 °C.

THE DELTA T THROUGH THE SAMPLE IS 18.75 °C
THE HIGHER TEMPERATURE IS 29.54 °C
THE DELTA T ACROSS THE STACK IS 81.59 °C
THE GUARD TEMPERATURE IS 49.10 °C

THE SAMPLE HAS A THERMAL CONDUCTIVITY OF 3.792624e-001 W/mK AND A THERMAL RESISTANCE OF 2.189385e-003 m2K/W AT A TEMPERATURE OF 72.69 °C

THE DELTA T THROUGH THE SAMPLE IS 19.52 °C
THE HIGHER TEMPERATURE IS 54.68 °C
THE DELTA T ACROSS THE STACK IS 30.55 °C
THE GUARD TEMPERATURE IS 72.62 °C



DuPont Electronic Laboratory Notebook

Identification Number : D100052-28.01

Experiment Name : D100052-13

Program Name : generic

Project Name: Thermoconductivity for Joel Citron

Document Name : D100052-13 series Thermal Conductive Zerilite Joel Citron.pdf

Site Name : EXP ST

Business Unit : Engineering Polymers

Author Name : Mike J. Molitor

Date : 02/26/2007 14:59:57

Co-Author Details :

Witness Name : Adcock, Dave

Date : 02/26/2007 15:03:04

Date (MM/DD/YY)	Signed by
2/26/2007 07:59:57 PM	Name: Mike J. Molitor Pre-Sig Hash: 9b9c723fedbb8ec913753be9ae4abce15c4f0fa1
Justification	By entering your password you verify that you planned and/or executed the work, directed the work, analyzed the result, or drew the conclusions described within this document.

2/26/2007 08:03:05 PM	Name: Adcock, Dave Pre-Sig hash: 4004778267dalf14aed9d10dd217ba30817d5b91
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	Pre-Sig Hash:
Justification	

	Name:
	Pre-Sig Hash:
Justification	

	Name:
	Pre-Sig Hash:
Justification	

	Name:
	Pre-Sig Hash:
Justification	

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Sample # D100052	13-1	13-2
Zenite 6000	55	
Jet ⁿ Talc 575C	37	
Carbon fiber Sig ⁿ itri	8	

E. I. du Pont de Nemours & Co.

Comp

WIRL 2006-299	DATE 8/6/85	TECHNICIAN J. BROWN
REACTOR 1	SCREW 1	NO. 1000012100
BARREL 1	SCREW 2	ADAPTER 1000012100
SCREW 1	SCREW 3	ADAPTER 1000012100
SCREW 2	SCREW 4	ADAPTER 1000012100
SCREW 3	SCREW 5	ADAPTER 1000012100
SCREW 4	SCREW 6	ADAPTER 1000012100
SCREW 5	SCREW 7	ADAPTER 1000012100
INTERLOCKS CHECKED		
RUN 5 STARTED		
EQUIPMENT USED		
Screw 1, 2, 3, 4, 5, 6, 7		
Barrel 1, 2, 3, 4, 5, 6, 7, 8, 9, 10		
ADAPTER 1, 2, 3, 4, 5, 6, 7, 8, 9, 10		
VACUUM		
PUMP		
COOLER		
FED 1 PPH		
FED 2 PPH		
FED 3 PPH		
PUMP GPH		
RATES PPH		
HOPPER WEIGHT		
HAND MELT		
CUTTER SPD		
COMMENTS		

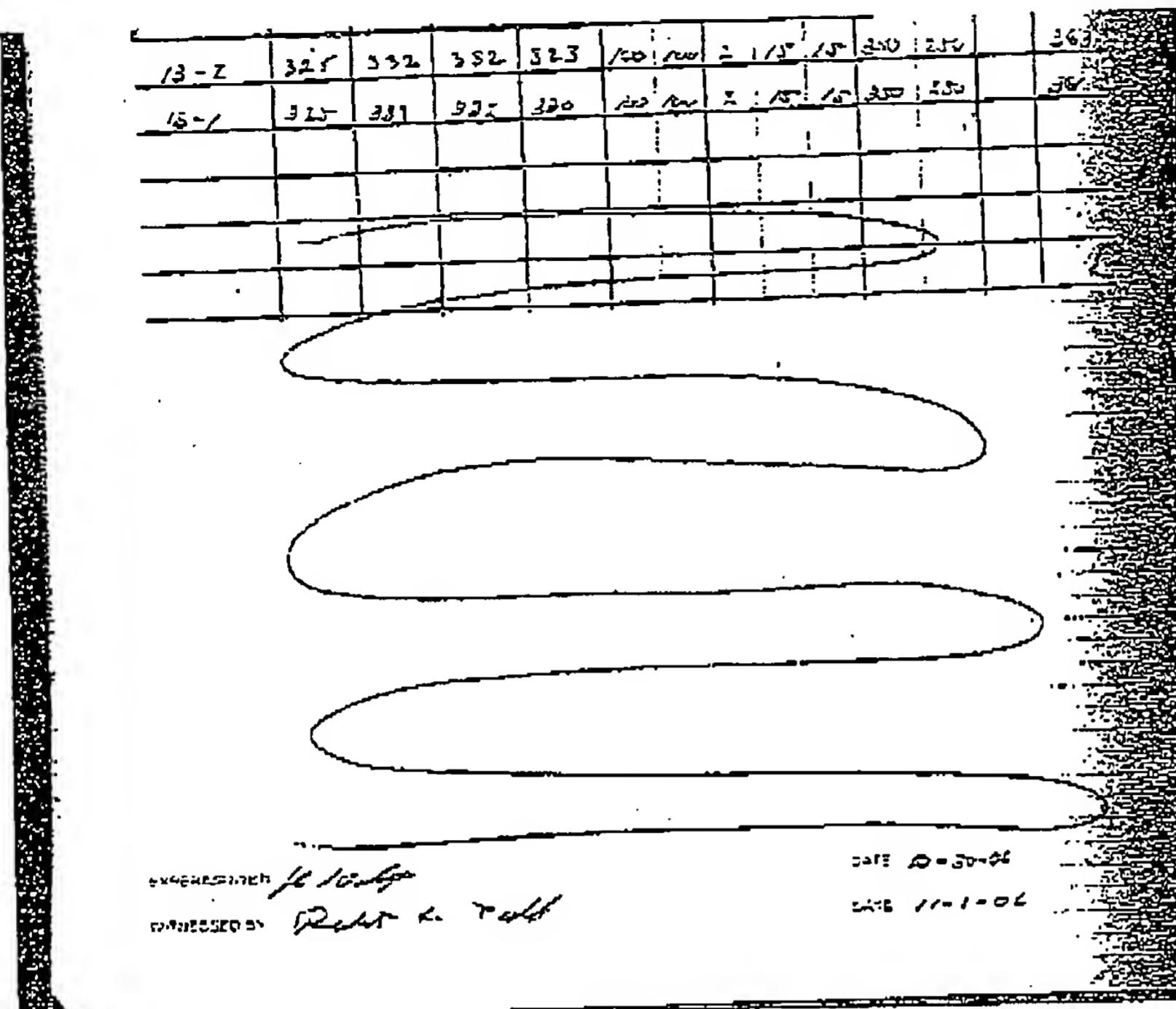
*Chase R. Smith
Stephen R. Reutzel*

57 m. 18.

SOOK	PAGE	E. I. du Pont de Nemours and Company							
1015		6 DR A	MAINTAIN IN CLEAN						
E 11156S- 86		run no	10-50						
		GENERAL TEST							
JR NO. 125 NB NO. 2		DATE 10-20-86	CYLINDER 6 D						
FOR NYLON		CHARGE SGU C	RAM SPEED EXP						
POLYMER TYPE ECONIC		SCREW C-P	SCREW SPEED -						
MOLD # 105 (E-T)		NOZZLE 5 MM	BAG PRESS -						
RECORD									
SAMPLE NO.	REAR	CONT'D	FRONT	NOZZLE	WOLD TEMP A / B	CYCLE B / ! / M	PRESS SPEED MM PER	BAGT	SPACER
13-2	325	352	352	323	401 MM	15	15 300	230	553

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NO. 1294 P. 16





DuPont Electronic Laboratory Notebook

Identification Number : D100052-28.01

Experiment Name : D100052-13

Program Name : Zenite

Project Name: Thermoconductivity for Joel Citron

Document Name : D100052-13 series Thermal Conductive Zenite Joel Citron.pdf

Site Name : EXP ST

Business Unit : Engineering Polymers

Author Name : Mike J. Molitor

Date : 02/26/2007 14:59:57

Co-Author Details :

Witness Name : Adcock, Dave		Date : 02/26/2007 15:03:04
Date (GMT)	Signed by	
2/26/2007 07:59:57 PM	Name: Mike J. Molitor Pre-Sig Hash: pb9c723fedbb8ec913753bs9ac4abce15c4f0fa1	
Justification	By entering your password you verify that you planned and/or executed the work, directed the work, analyzed the result, or drew the conclusions described within this document.	
2/26/2007 08:03:05 PM	Name: Adcock, Dave Pre-Sig Hash: 40d4778267da1f14a6d9d106d217ba30817d5b91	
Justification	By entering your password you will be signing to say that you have witnessed the information contained in this document	
	Name:	
	Pre-Sig Hash:	
Justification		
	Name:	
	Pre-Sig Hash:	
Justification		
	Name:	
	Pre-Sig Hash:	
Justification		
	Name:	
	Pre-Sig Hash:	
Justification		

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E.I. du Pont de Nemours and Company

Sample # D100052	13-1	13-2
Zenite 6000	55	
Jetfil Talc 575C	37	
Carbon fiber Sigranil	8	

E. I. du Pont de Nemours and Company

Camp

J.R.H. 25025-363	DATE 6/11/08	TECHNICIAN M.J. LIPKIN
RESCRATCHER	M.J. LIPKIN	NO. 100052
BARREL	SCREW	SCREEN
DIE	ADAPTER	BACK PRESSURE
POLYMER	PLATES	WALLS
INTERLOCKED CHECKED	RUL STABILIZER	STABILIZER

AUXILIARY EQUIPMENT USED

SCREW SCRA	SCREW SCRA
ADAPTER	ADAPTER

SAMPLE#	13-1	13-2
TRAY	SEPTIS ACTUAL	ACTUAL
BT	ACTUAL	ACTUAL
BARREL 1	320	322
BARREL 2	320	304
BARREL 3	320	233
BARREL 4	320	233
BARREL 5	100	233
BARREL 6	320	233
BARREL 7	320	233
BARREL 8	320	233
BARREL 9	320	233
BARREL 10	320	233
BARREL 11	320	233
BARREL 12	320	233
BARREL 13	320	233
BT	320	322
ADAPTER		
SCREW SCRA	320	
TORQUE	25-50	
DIE PRESS	15-20	20-25
VACUUM	30	35
DOA		
DCV		
FEED TUBE	1/4	1/4
HOLD STAB	3.0	4.0
FEED SPAN		
SCREW RPM		
POLYMER RPM	2400	2000
BACK PRESS		
HOLD TIME	3.0	3.0
CUTTER SPD		

COMMENTS

Shawn R. Keathley

Shawn R. Keathley

DATE 6/11/08

57 min diff.

BOOK PAGE E. I. du Pont de Nemours and Company

6 OR 8 INJECTION CYCLES DATE 6/11/08

E 111558- 36

TESTING CYCLE TEST

BARREL NO. 575 NO. 2 NO. 52	DATE 6/11/08	CYLINDER 6.07
FOR 400000	CHARGE 550	SCREW SPEED 400 RPM
POLYMER TYPE ZENITE	SCREW 6.0	SCREW SPEED 400 RPM
MOLD # 100052 15-20	NOZZLE 2.5	BACK PRESS 400

SAMPLE NO.	ROAR	CENTER	FRONT	NOZZLE	WOLD TEMP	CYCLE	FREEZ	SOFT	SOFT
13-2	325	352	352	323	400	2	13	15	350

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NO. 1294 P. 19

DUPONT DuPont Electronic Laboratory Notebook

Identification Number : D100008 21.02

Experiment Name : D100008-18

Program Name : Zanite

Project Name: Thermal Conductivity

Document Name : ThermalConductivityofD100052-13-1and13-2.pdf

Site Name : EXP ST

Business Unit : Engineering Polymers

Author Name : Adcock, Dave

Date : 02/26/2007 12:57:03

Co-Author Details :

Witness Name : Harvey, Pat A.	Date : 02/26/2007 13:07:04
<p>Name: Adcock, Dave 3/26/2007 06:07:04 PM Pre-Sig Hash: 73b0cadec1bdedf8234bdc64d81ae2e301af81ba By entering your password you verify that you planned and/or executed the work, directed the work, analyzed the result, or drew the conclusions described within this document.</p>	
<p>Name: Harvey, Pat A. 3/26/2007 06:07:04 PM Pre-Sig Hash: 73b0cadec1bdedf8234bdc64d81ae2e301af81ba By entering your password you will be signifying to say that you have attested the information contained in this document.</p>	
<p>Name: Pre-Sig Hash:</p>	

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TEST DESCRIPTION

TEST 2-13-1

Infrared coated disc

SAMPLE ID: 16-1
 SAMPLE THICKNESS: 0.030mm

Average sample temperature = 55 C Controller= 50 C

TG (C)	EG (C)	TL (C)	TU (C)	TD (C)	Q	RATIO
50.0	48.2	40.2	39.0	19.64	9472.1	0.23266
50.6	48.0	40.8	29.0	19.75	10086.7	0.195657
50.6	48.1	40.9	29.5	19.73	10107.1	0.195166

Average sample temperature = 55 C Controller= 55 C

TG (C)	EG (C)	TL (C)	TU (C)	TD (C)	Q	RATIO
73.1	65.8	53.4	49.2	19.74	8354.4	0.283231
65.2	72.0	65.8	56.7	19.68	30161.7	0.193207
85.2	72.0	65.6	54.7	19.62	30167.6	0.183013

USING CALIBRATION FILE: EST04200.DAT

USING FIRST ORDER FIT

USING TEST FILE: 16-1.txt

SAMPLE ID: 16-1
 SAMPLE THICKNESS: 0.030mm
 GTE: 0.000e+000

THE SAMPLE HAS A THERMAL CONDUCTIVITY OF: 3.651347e-001 W/mK
 AND A THERMAL RESISTANCE OF: 2.203808e-003 m²K/W
 AT A TEMPERATURE OF: 50.78 C

OPEN WORK

THE DELTA T THROUGH THE SAMPLE IS: 19.73 C
 THE HEATER TEMPERATURE IS: 29.54 C
 THE DELTA T ACROSS THE STACK IS: 21.10 C
 THE GUARD TEMPERATURE IS: 42.10 C

THE SAMPLE HAS A THERMAL CONDUCTIVITY OF: 3.702624e-001 W/mK
 AND A THERMAL RESISTANCE OF: 2.133355e-003 m²K/W
 AT A TEMPERATURE OF: 75.40 C

OPEN WORK

THE DELTA T THROUGH THE SAMPLE IS: 19.62 C
 THE HEATER TEMPERATURE IS: 54.68 C
 THE DELTA T ACROSS THE STACK IS: 30.56 C
 THE GUARD TEMPERATURE IS: 72.02 C

TEST NUMBER: 13-1
TEST DATE: 7/11/08

Infrared shielded dsc

SAMPLE ID: 13-1
SAMPLE THICKNESS: 3.030mm

Average sample temperature = 30.0 Controller= 30.0 C

TG (C)	TG (C)	TL (C)	TH (C)	TH (C)	G	RATIO
50.0	49.2	49.2	39.5	19.64	9472.1	0.211266
60.6	58.0	49.8	29.5	19.75	30086.7	0.195657
60.5	48.1	40.9	29.5	19.73	10107.1	0.195166

Average sample temperature = 30.0 Controller= 30.0 C

TG (C)	TG (C)	TL (C)	TH (C)	TH (C)	G	RATIO
78.1	65.9	59.4	49.5	19.74	8654.4	0.233231
66.2	72.0	65.6	54.7	19.63	10181.7	0.198207
65.2	72.0	65.6	54.7	19.62	10187.3	0.198013

USING CALIBRATION FILE: 2510420043

USING FIRST ORDER FIT

USING TEST FILE: 13-1

SAMPLE ID: 13-1
SAMPLE THICKNESS: 3.030mm
CTE: 0.0000100

THE SAMPLE HAS A THERMAL CONDUCTIVITY OF: 3.66137e-001 W/mK
AND A THERMAL RESISTANCE OF: 0.225809e-003 m2K/W
AT A TEMPERATURE OF: 50.73 C

THE DELTA T THROUGH THE SAMPLE IS: 19.73 C
THE HEATER TEMPERATURE IS: 29.54 C
THE DELTA T ACROSS THE STACK IS: 31.40 C
THE GUARD TEMPERATURE IS: 46.10 C

THE SAMPLE HAS A THERMAL CONDUCTIVITY OF: 3.792624e-001 W/mK
AND A THERMAL RESISTANCE OF: 0.225385e-003 m2K/W
AT A TEMPERATURE OF: 75.49 C

THE DELTA T THROUGH THE SAMPLE IS: 19.62 C
THE HEATER TEMPERATURE IS: 54.86 C
THE DELTA T ACROSS THE STACK IS: 39.55 C
THE GUARD TEMPERATURE IS: 72.02 C

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